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(51) INT CL[6]
H04M 3/42

(52) UK CL (Edition P)
H4K KFH KF42

(56) Documents Cited
EP 0283120 A1 EP 0166318 A2
WPI Abstract Accession No: 97-305198/199728 & JP 9116940A Patent Abstracts of Japan, vol.94, No.10, & JP 6303320A WPI Abstract Accession No: 94-195600/199424 & JP 6133044A

(58) Field of Search
UK CL (Edition O) H4K KFH KF42
INT CL[6] H04M 3/42
ONLINE: WPI

(54) Voice dialling server for branch exchange telephone systems

(57) The voice dialing server plugs into one or more unused extensions of a branch exchange system to provide each of the users on the system with voice dialing services. To use the system a user simply dials the extension to which the server is attached. The server then prompts the user to supply the name of a party to be called. The name is then looked up in a telephone number dictionary unique to that user. The system then places the telephone call by sending commands to the branch exchange system that simulate the operations a user would perform to connect to an outside line or inside extension and then place the call. The server incorporates a speech processing module having a multistage word recognizer that represents speech in terms of high phoneme similarity values. This representation is highly compact, allowing the word recognizer to perform the recognizer and fine match stages with far less processor overhead than frame-by-frame speech recognizers.

FIGURE 1

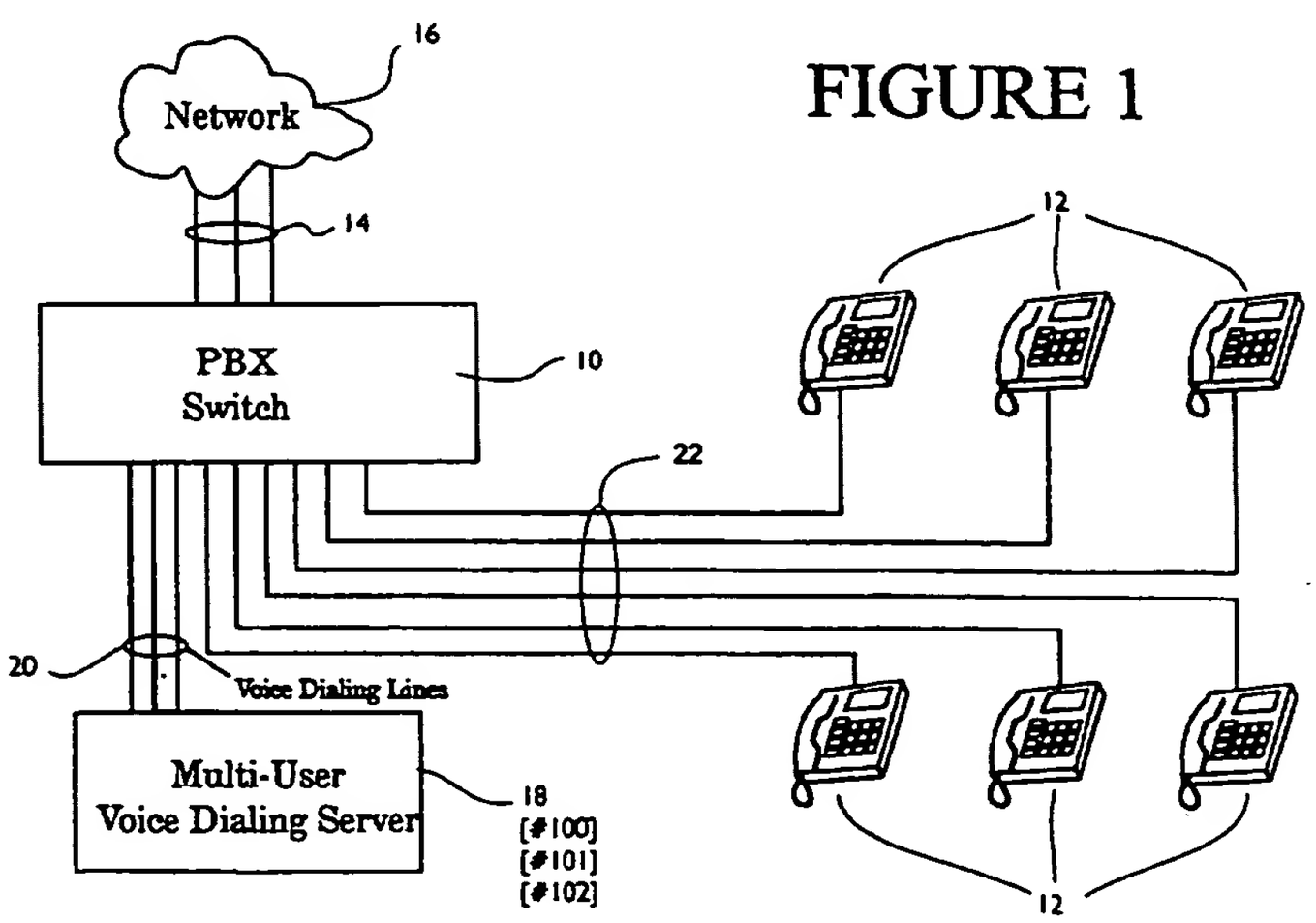

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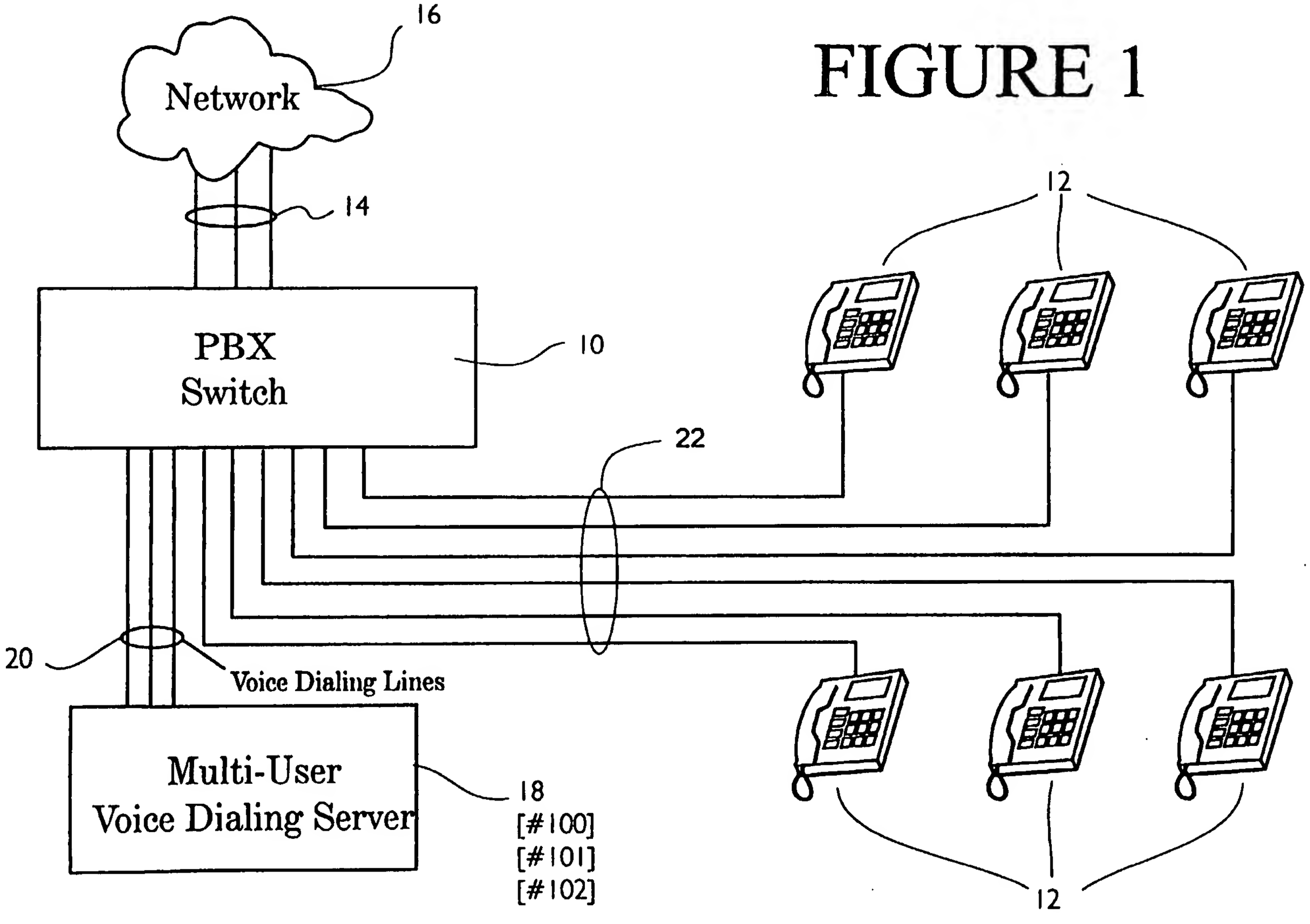
FIGURE 1


16
Network
14
PBX
Switch
10
22
20
Voice Dialing Lines
Multi-User
Voice Dialing Server
18
[#100]
[#101]
[#102]
12
12

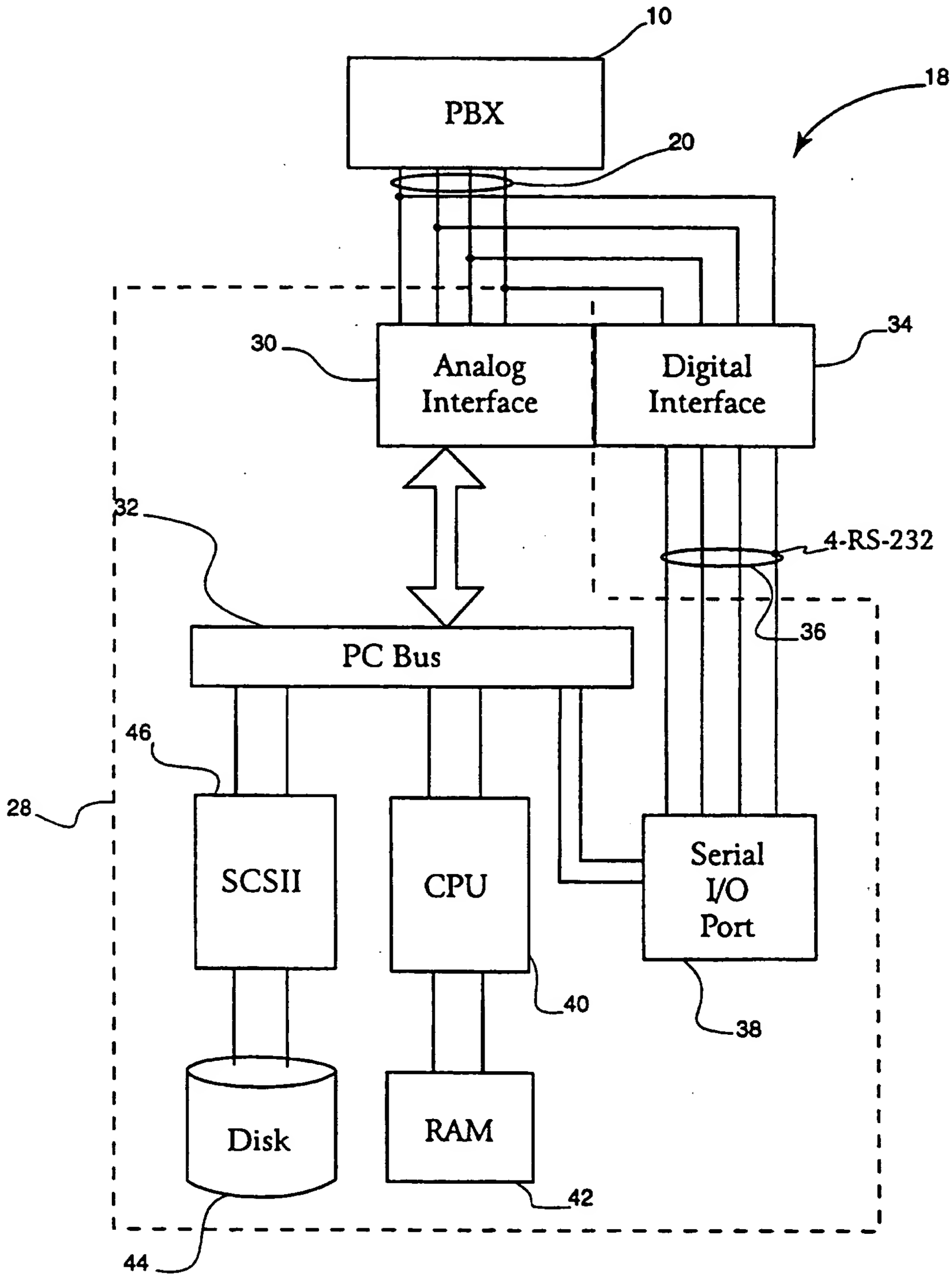

10
PBX
18
20
30
Analog Interface
Digital Interface
34
32
4-RS-232
36
PC Bus
46
28
SCSII
CPU
Serial I/O Port
40
38
Disk
RAM
42
44

Figure 2

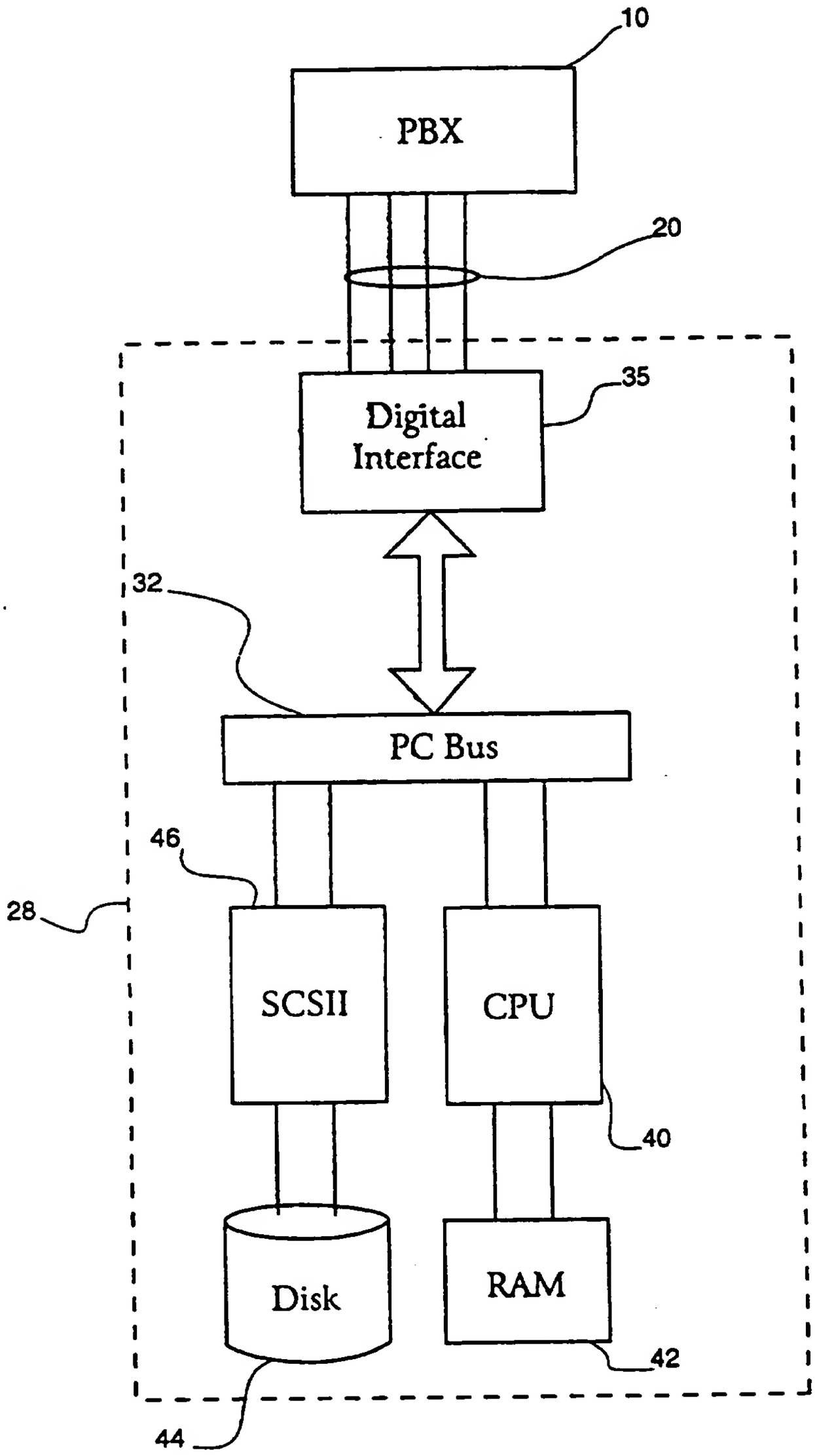

10
PBX
20
35
Digital
Interface
32
PC Bus
46
28
SCSII
CPU
40
Disk
RAM
42
44

Figure 3

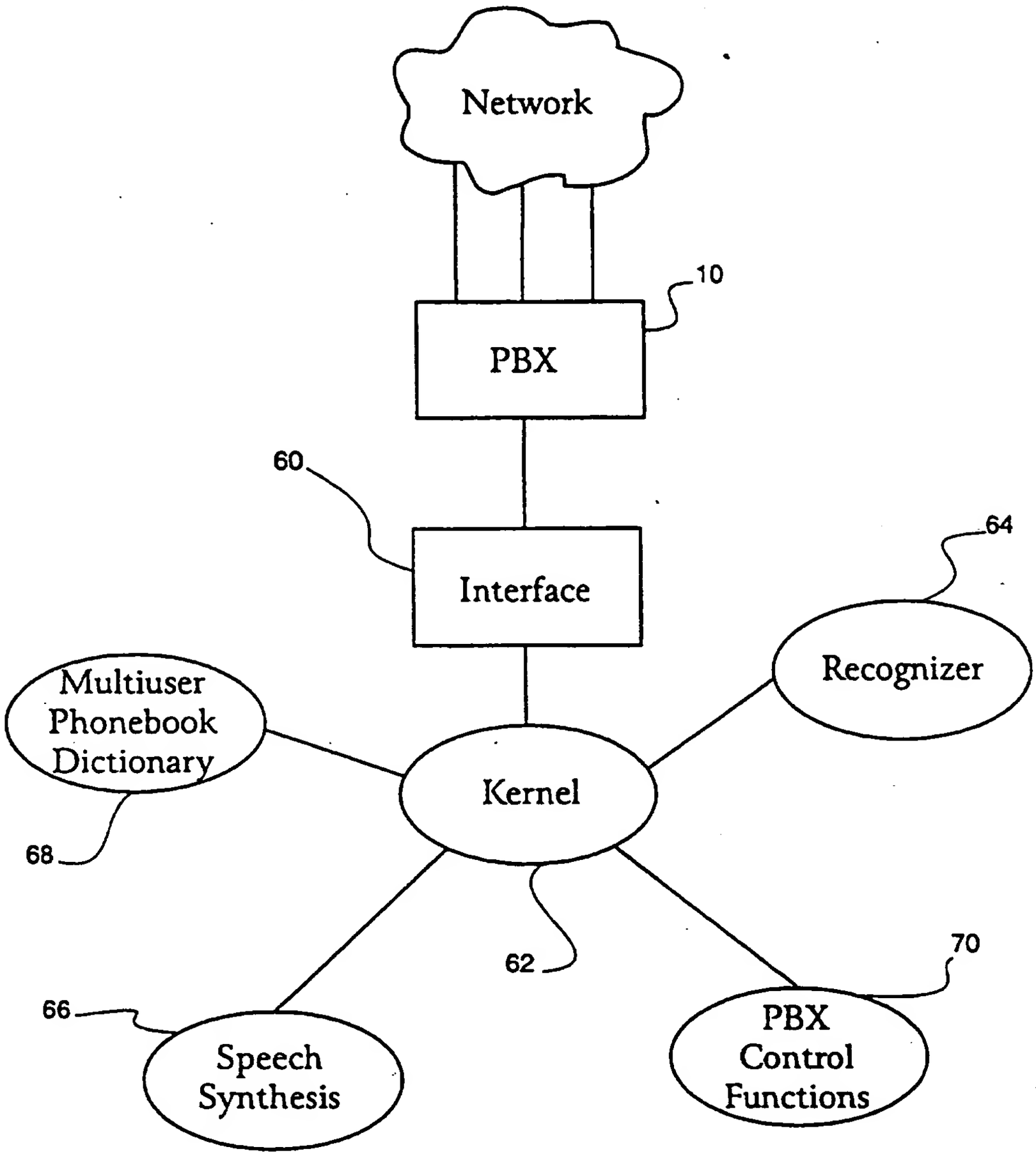
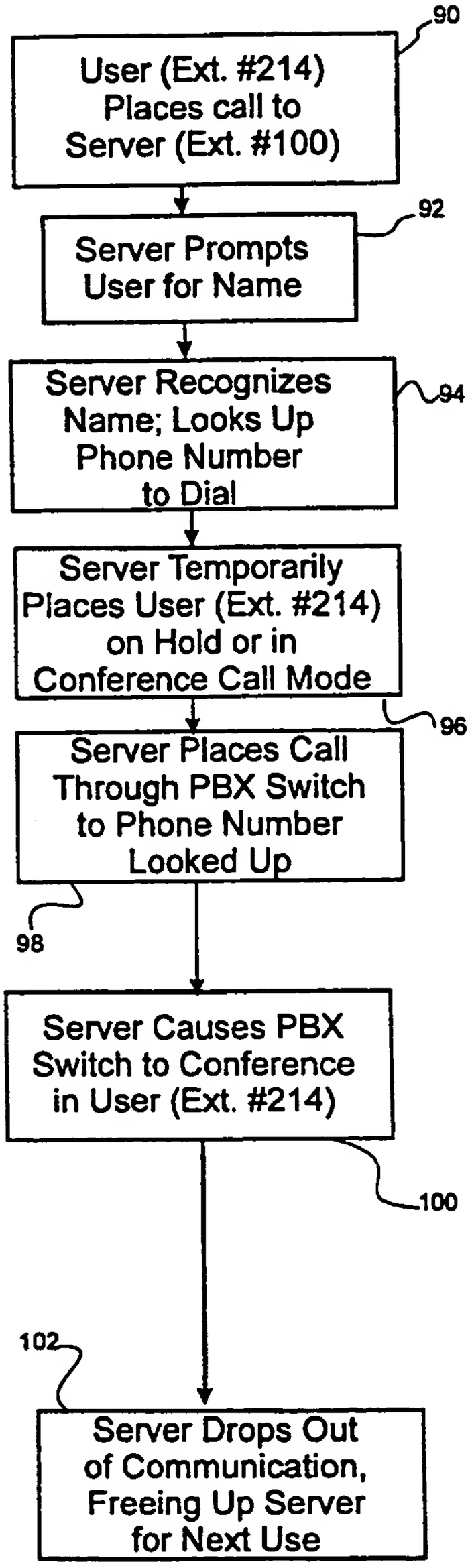
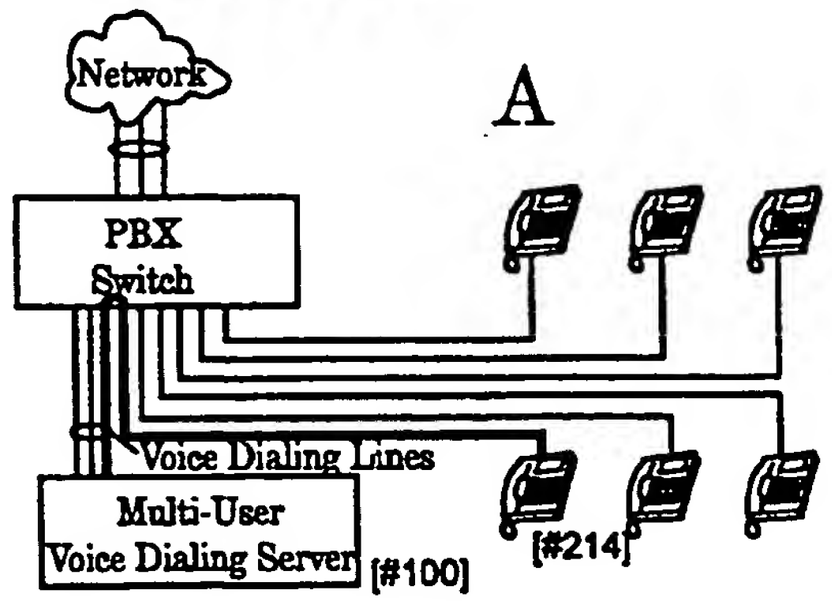
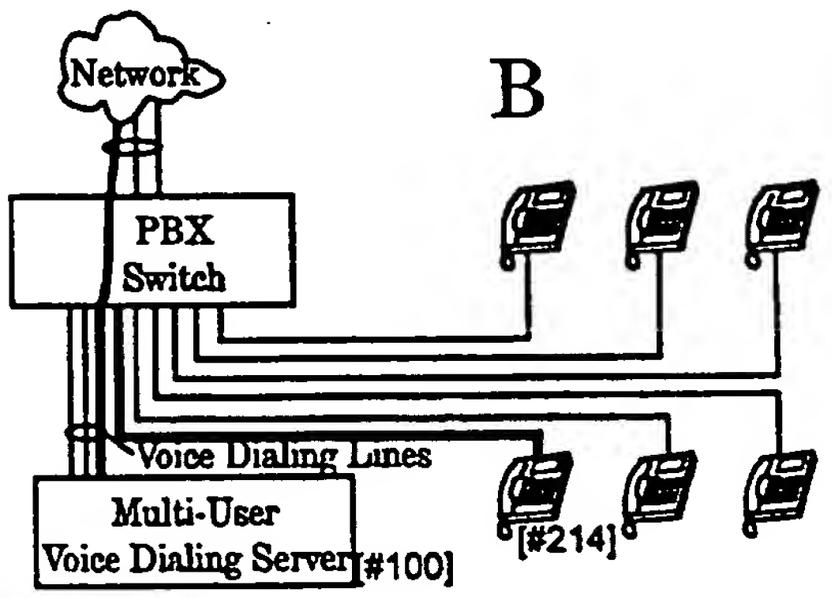

Network
10
PBX
60
Interface
64
Recognizer
Multiuser
Phonebook
Dictionary
68
Kernel
62
70
66
Speech
Synthesis
PBX
Control
Functions

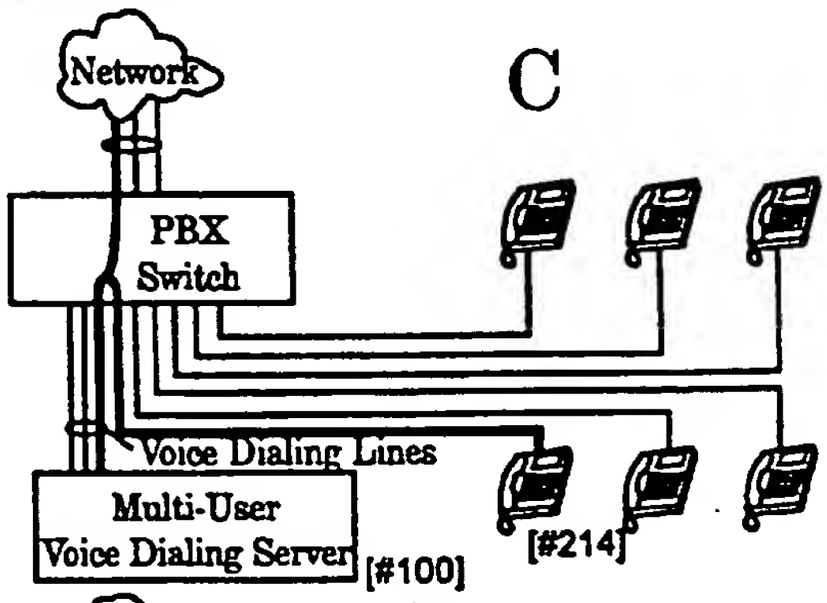
Figure 4

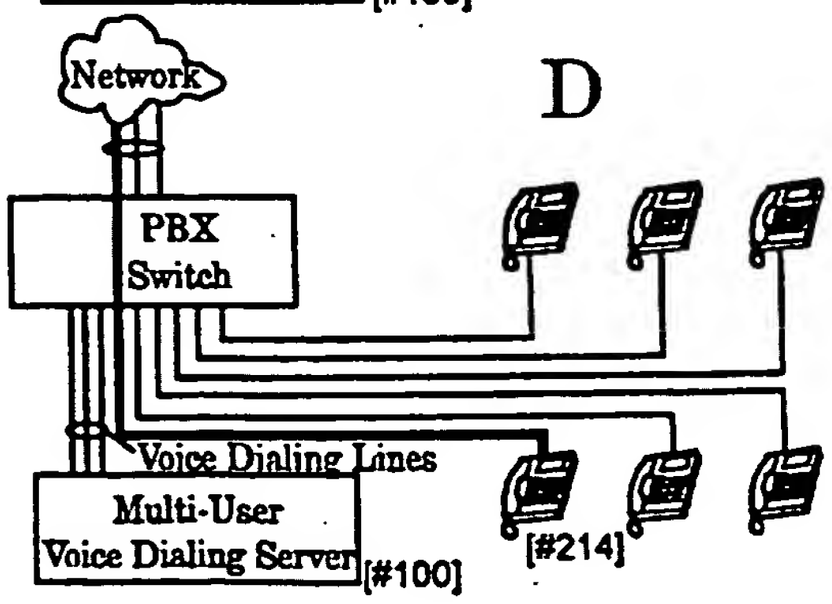
FIGURE 5


User (Ext. #214) Places call to Server (Ext. #100)
90
Server Prompts User for Name
92
Server Recognizes Name; Looks Up Phone Number to Dial
94
Server Temporarily Places User (Ext. #214) on Hold or in Conference Call Mode
96
Server Places Call Through PBX Switch to Phone Number Looked Up
98
Server Causes PBX Switch to Conference in User (Ext. #214)
100
102
Server Drops Out of Communication, Freeing Up Server for Next Use


A
Network
PBX Switch
Voice Dialing Lines
Multi-User Voice Dialing Server
[#100]
[#214]


B
Network
PBX Switch
Voice Dialing Lines
Multi-User Voice Dialing Server
[#100]
[#214]


C
Network
PBX Switch
Voice Dialing Lines
Multi-User Voice Dialing Server
[#100]
[#214]


D
Network
PBX Switch
Voice Dialing Lines
Multi-User Voice Dialing Server
[#100]
[#214]

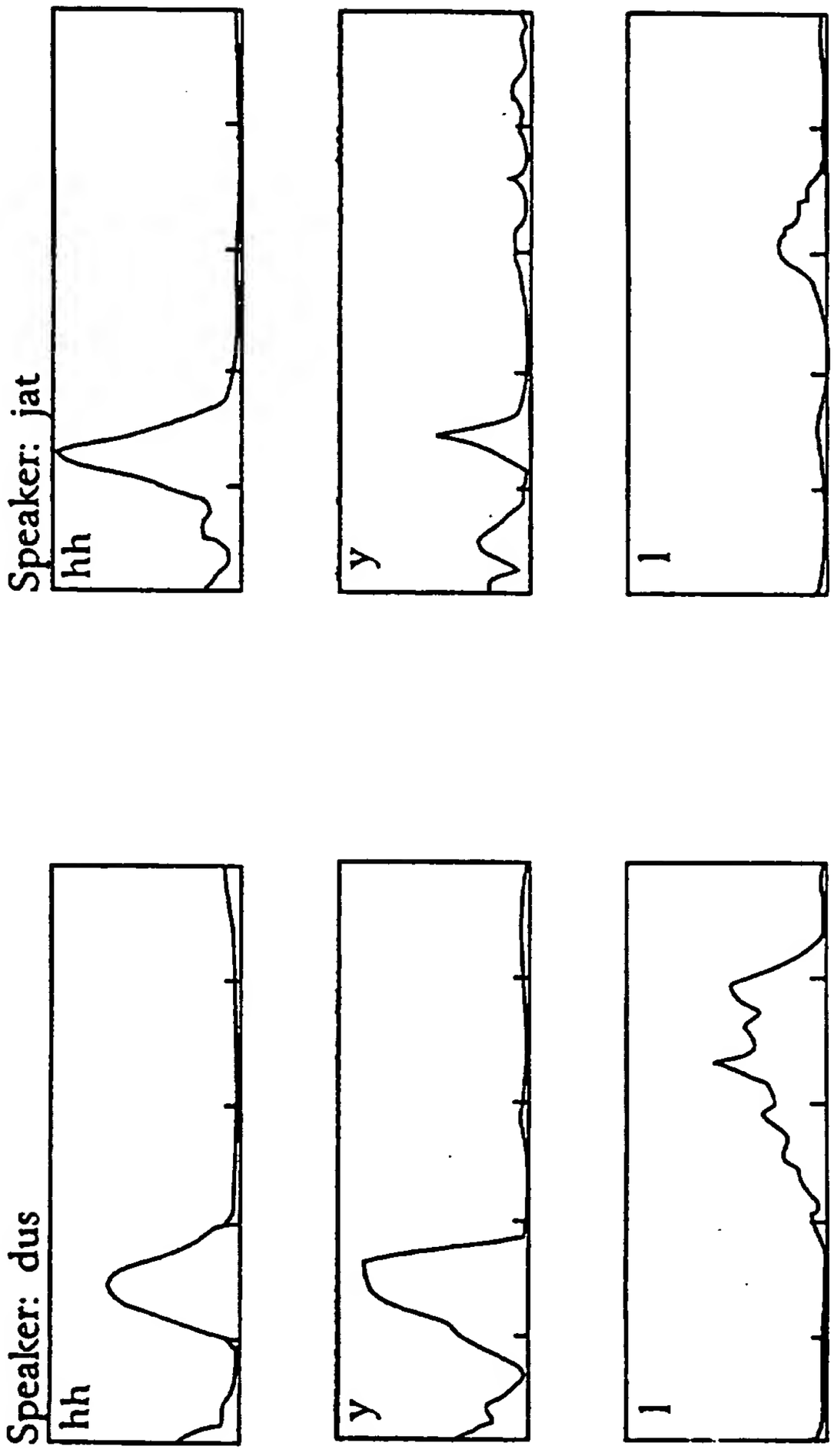


Figure 6

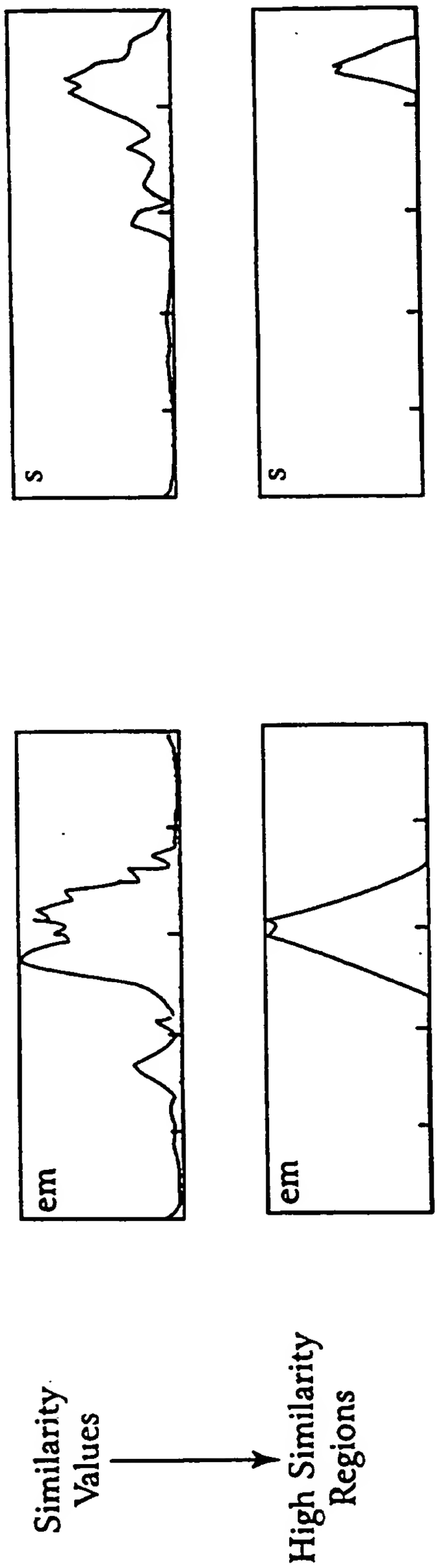


Figure 7

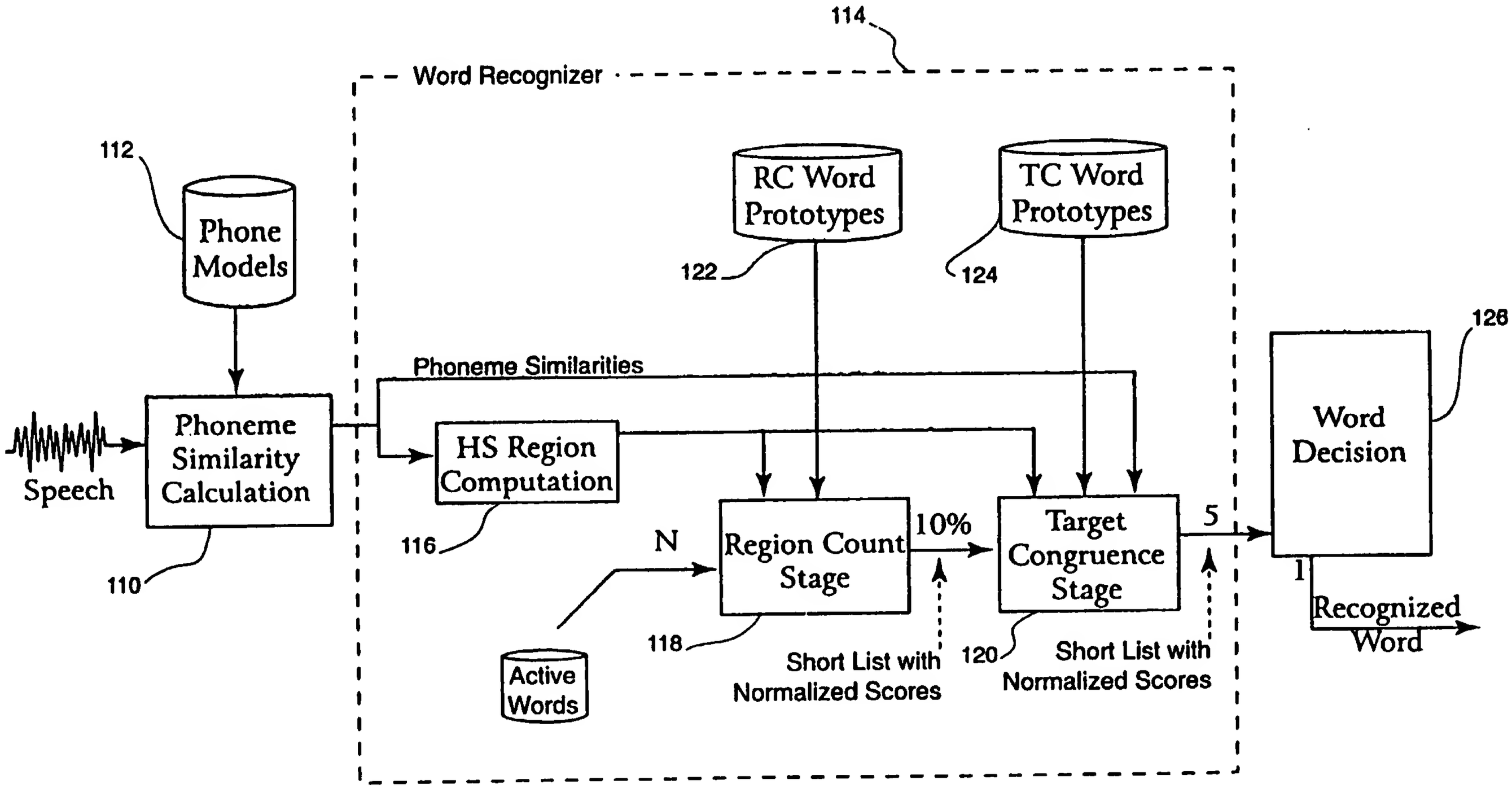

114
Word Recognizer
112
Phone Models
RC Word Prototypes
122
TC Word Prototypes
124
126
Phoneme Similarities
Word Decision
Phoneme Similarity Calculation
HS Region Computation
Speech
110
116
N
Region Count Stage
10%
Target Congruence Stage
5
1
Recognized Word
Active Words
118
120
Short List with Normalized Scores
Short List with Normalized Scores

Figure 8

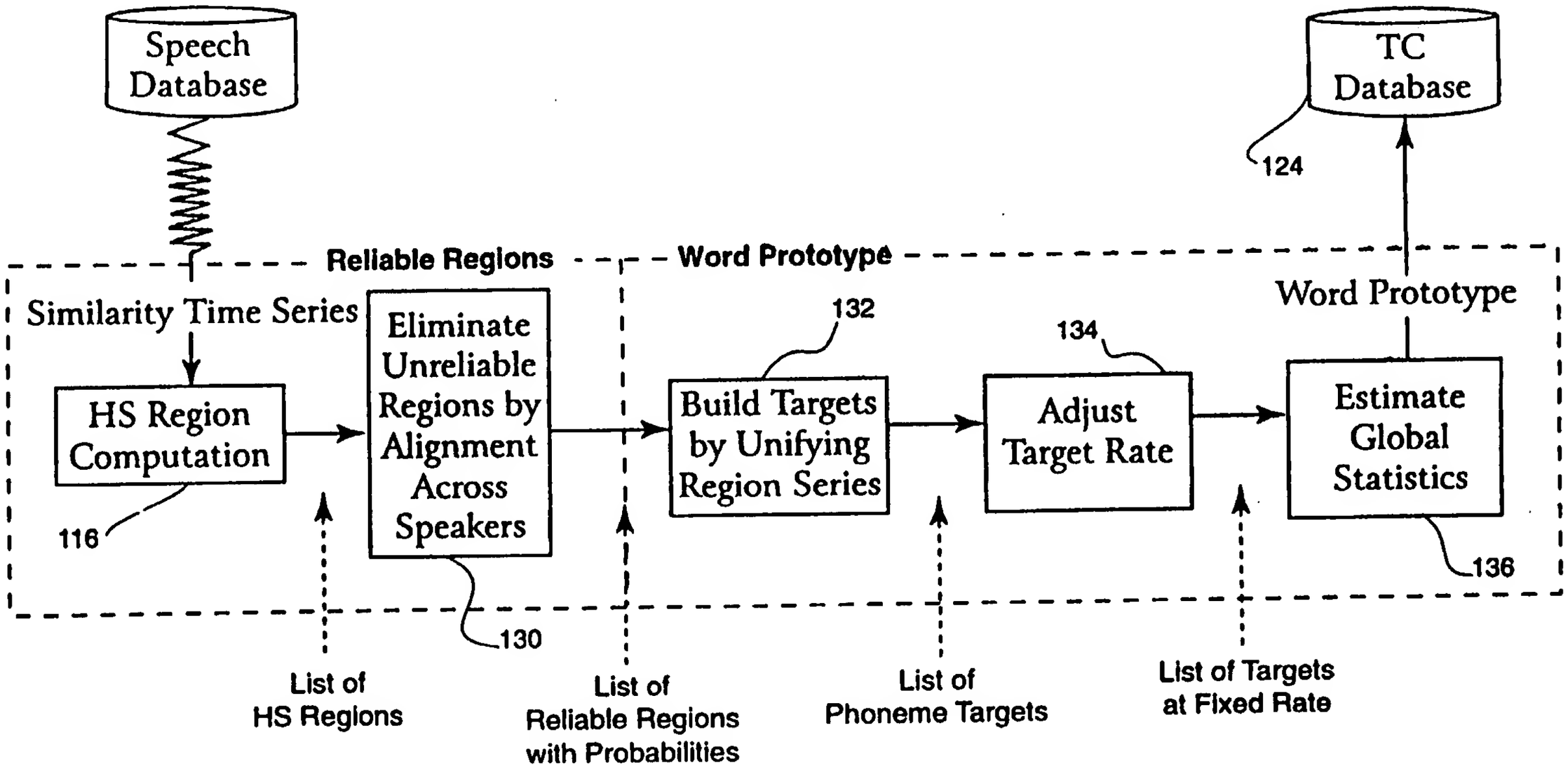

Speech Database
TC Database
124
Reliable Regions
Word Prototype
Similarity Time Series
Word Prototype
HS Region Computation
116
Eliminate Unreliable Regions by Alignment Across Speakers
130
132
Build Targets by Unifying Region Series
134
Adjust Target Rate
Estimate Global Statistics
136
List of HS Regions
List of Reliable Regions with Probabilities
List of Phoneme Targets
List of Targets at Fixed Rate

Figure 9